Alpha and omega: this time from Agritechnica all the way to Mexico

CUTEC NEWS

FACTS · INFORMATION · ANALYSES

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Competence (cluster)

The term competence is derived from the Latin word competere ('come together, meet'). It designates a person's ability to perform, or responsibility for performing certain tasks independently. The meaning of the term competence in the sense of authority – in conjunction with a position or office – is gradually fading into oblivion nowadays. In contrast, the importance of the term for describing a person's qualities is steadily increasing: The statement or opinion that someone is competent because he is especially well qualified in a particular field can be heard all the more frequently. Combinations of the term competence with another word are also widespread: Think of a competence centre or – perhaps better known since the last federal election in Germany – a "competence team". What does this have to do with CUTEC? At CUTEC, preparations are currently under way for the establishment of a competence cluster entitled "Energy, Fuels, and Chemical Raw Materials from Biomass". The objectives include the continuing promotion of interdisciplinary cooperation at CUTEC, on the one hand, and the accelerated development of professional excellence, on the other hand. At present, this cluster is still an experimental model; two additional clusters may possibly be established later, if the experience gained with this model proves to be favourable. Moreover, the establishment of clusters corresponds with the objectives of encouraging the independent work of our scientific employees and thus of further developing their competence from a scientific, acquisitional, and organisational standpoint. Special team competence at CUTEC can be found in the Department of Modelling and Simulation. In a sense, the work and success of this department are based entirely on the numbers 0 and 1, as well as competence in dealing with these two numbers. A description of the department is presented on page 4. Unfortunately, it is not possible to present our detailed report on Werner Grübmeyer in the present issue of CUTEC-News, but it will certainly be published in the next issue. He is thoroughly familiar with the political structures in Lower Saxony and has thus been a competent advocate of CUTEC in political and administrative circles for many years. Be assured of an interesting article about a partner who has remained true to CUTEC over the years! Furthermore, I wish to draw special attention to the reports devoted to CUTEC activities on an international level in this issue: On the one hand, a delegation led by Lower Saxony's Minister of the Economy Hirche visited Mexico and the United States (page 1). On the other hand, a UNESCO delegation was received by CUTEC (page 2). Finally, an article on page 7 is devoted to the visiting scientists who contribute daily to CUTEC's international flair.

Yours, Otto Carlowitz

IN THIS ISSUE

CUTEC accompanies Lower Saxony Minister for Economic Affairs Hirche to Mexico and the USA

International Operations Manager Dr.-Ing. Theodore Onyeche represented CUTEC as part of a 33-member delegation invited by the Minister for Economic Affairs of the German state of Lower Saxony, Walter Hirche, on a visit to Mexico and the USA from September 27th to October 5th, led by the Minister himself. The object of the trip, organized by the state of Lower Saxony, was to establish new business contacts and strengthen existing links in dialog with high-ranking business and political figures, including the Mexican Minister of Finance. On the lookout for

In Mexico: Minister Hirche (left), Dr. Onyeche (centre) and German Ambassador Dr. Kölsch (right)

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CUTEC accompanies Lower Saxony Minister for Economic Affairs Hirche to Mexico and the USA

The delegation from Lower Saxony on a visit to the VW plant in Puebla, Mexico

future project partners, Dr. Onyeche delivered a series of presentations in Mexico setting forth the CUTEC range of environmental solutions to deal with the problems of developing and emerging countries, and a number of Mexican companies showed considerable interest in what he had to offer. Their concerns were focused particularly in the areas of wastewater treatment, solid waste, air purification, and practical training in environmental engineering. The delegation was supported on its visit to Mexico by the local German Chamber of Industry and Commerce and the German Ambassador, Dr. Eberhard Kölsch, who personally provided the delegates with expert and highly committed backing, as well as introducing them to leading Mexican decision-makers at a reception held at the German Embassy. The trip also included visits to German companies, such as VW and Pelikan, who already have business operations in Mexico. From Mexico the delegation moved on to the second leg of its trip in Atlanta, Georgia, where it was welcomed by representatives of the German Consulate General and the German-American Chamber of Commerce. In Atlanta Minister Hirche officially opened a new Business Center for small and medium-sized enterprises from Lower Saxony looking to make the city their jumping-off point for entry into the US market, aided by the existing network of the German-American Chamber of Commerce. Dr. Onyeche's schedule also took in visits to environmental facilities as well as to a number of companies operating in various fields, including biotechnology. CUTEC already has links with the USA, and is currently running a small-scale consulting project there. Commenting on the visit, Dr. Onyeche made the point that, though the USA is technologically highly developed, it does have major deficits in the environmental field, citing as one example the fact that the US Government has not yet ratified the Kyoto Protocol. He was generally very pleased with how the trip went, having established many interesting new contacts for CUTEC both in Mexico and in the USA. His primary aims on the trip were to get the CUTEC name known in the regions visited, to identify their particular environmental problems and to ascertain the possibilities for local project partnerships in order to work jointly towards sustainable solutions. Interested parties from both countries have announced their intention to make a return visit to CUTEC next year in order to strengthen links and work up concrete plans for potential collaboration projects in the regions visited by the delegation. Dr. Onyeche was particularly impressed by Minister Hirche's leadership of the delegation and his personal commitment throughout the trip, stating that, as a result, he looked forward to working together with the Minister and with the state of Lower Saxony on behalf of CUTEC whenever the opportunity may arise.

And the Minister for Economic Affairs himself, in a press release issued by his Ministry, made the following comment on the trip:

"This visit was a further step in our foreign trade initiative aimed at making the economy of Lower Saxony even more international, and even more competitive."

(he/on)

UNESCO delegation from Qatar visits CUTEC

For over two years now CUTEC's operations have also extended to the Middle East. In the Sheikhdom of Qatar, for example, CUTEC is supporting a UNESCO environmental education programme titled "Rashid – The Recycler". This is linked with a newly developed school book aimed at encouraging young people aged 12 to 18 to take an interest in environmental protection and, in particular, the issue of recycling. "Our cooperation in this project is the latest example of our longstanding close relationship with UNESCO in Qatar and with its local head of science programme, Dr. Benno Boer", reports Dr. Onyeche, CUTEC International Operations Manager. The book, which is used by pupils, is accompanied by a quiz involving questions on recycling and by a photographic competi-tion. The top prize on offer was a trip to Europe, organised by the UNESCO office in Doha. The agenda featured a visit to UNESCO headquarters in Paris as well as to the CUTEC base in Clausthal-Zellerfeld, and on to Goslar, to tour the UNESCO World Cultural Heritage Sites of the Rammelsberg Museum and the historic old town. And so it was that on August 26th the UNESCO delegation, including the competition prize-winners and accompanying adults, together with a government representative from Qatar, and led by Dr. Ahmed Osman from UNESCO office in Paris, arrived at CUTEC. The well-travelled group was met by the CUTEC Managing Director, Professor Carlowitz, and his International Operations Manager, Dr. Onyeche. After the official welcome, Dr. Onyeche made a presentation high-

A warm welcome for the UNESCO delegation at CUTEC

Continued on page 3

Mathematical modelling and experimental investigations on the pyrolysis of wastes in rotary kilns

Within the scope of a joint research project funded by the DFG, the pyrolysis of wastes in fluidised bed reactors and rotary kilns has been investigated experimentally and mathematically modelled. The partners in the research project were the University of Hamburg, Institute of Technical and Macromolecular Chemistry (ITMC), the Bauhaus University in Weimar, Professorship for Processes and Environment (LVU), and CUTEC, Department of Thermal Processes.

For minimising the experimental effort and expense in investigating the pyrolysis of unknown mixtures of input materials in reactors, mathematical models may be very useful for determining optimal operational parameters, in order to achieve a specified product yield or product quality, for instance.

The objective of the investigations with the indirectly heated rotary kiln at CUTEC (figure, top) was the development of an appropriate mathematical model (designated as the process model in the following) in cooperation with the LVU. The purpose of the model is to provide a correct description of the reactor behaviour, the heat and mass transfer, and the conversion processes for waste mixtures of complex composition in indirectly heated rotary kilns.

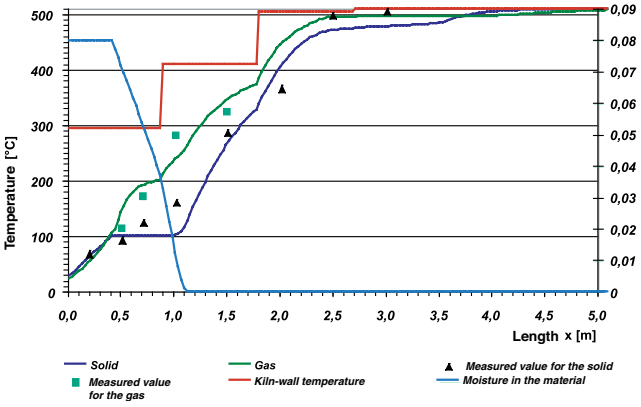
The process model consists of a reactor model and a basis model. The reactor model describes the residence-time behaviour of the input material in the rotary kiln as a function of the geometry as well as the material and operational parameters. In the basis model, the temperatures of the gases and solids, as well as the essential gas concentrations, are calculated in the axial direction of the rotary kiln by material and energy balancing, and with the use of kinetic data from thermogravimetric analyses.

Photograph of the pilot plant: indirectly heated rotary kiln at CUTEC-Institut

The process model was first adapted for inert input materials, that is, without conversion, with the results of measurements on sand, for variations of temperature and mass flow rate, before considering the conversion processes during pyrolysis of polyethylene (PE) in a mixture with wet sand in the rotary kiln with this model. The results of measurement agree well with those from modelling, as shown in the figure on the right. In the drying range, the calculated temperature of the solids remains constant, as expected. PE conversion occurs at about 440 °C. Because of the heat consumption during cracking and vaporisation of the PE, the solid material is heated more slowly, and the temperature variation is less steep. After completion of conversion at about 4 m, the solid attains the specified kiln wall temperature of 510 °C.

For a dry waste mixture, the temperature curve for the solid was correctly reproduced, with due consideration of a contamination factor which accounts for sticking of a waste deposit on the inside wall of the kiln all the way to coking. To a first approximation, the gas temperature was also described with sufficient accuracy by the mathematical model.

Within the scope of industrial projects, the model is currently being applied successfully to other input materials for the purpose of test planning. In the future, the mathematical model should receive increased use for designing and optimising the process for practical applications in industry, after testing on a pilot scale. (ge/bm)



Calculated and experimentally determined temperature curves in the solid and in the gas, as well as variation of the moisture content in the solid along the length of the kiln during pyrolysis of a wet polyethylene-sand mixture at specified kiln-wall temperatures

Continuation from page 2

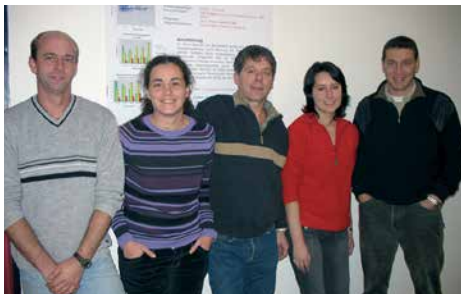
UNESCO delegation from Qatar visits CUTEC

lighting CUTEC's potential in the field of environmental services and emphasising CUTEC's aim to expand its operations in the Arab states. He was particularly keen to encourage the young prize-winners to commit their efforts towards safeguarding a clean environment in their homeland. The visitors were then taken on a tour of the building and testing halls, where they were shown a number of on-going projects at the facility. The delegation was visibly impressed, and intends to investigate the possibilities of a collaboration with CUTEC in environmental matters on their return home. Following a business lunch, the visitors headed off to visit the UNESCO sites in Goslar, which lies about 23 km from Clausthal. (he/

Animated discussion in front of a landfill model

Description of a department: Modelling and Simulation

With 0 and 1 for describing systems and their properties



An efficient international team: Dipl.-Ing. Harneit, Dipl.-Geol. Rosendo Vales, PD Dr.-Ing. Reuter, Dipl.-Ing. Skorupskaite and Dr. rer. nat. Tadjine (v. l.)

Zero and one are the two possible values of a bit. Eight bits constitute a byte, and many millions of bytes are often necessary for designing a software program which is capable of describing systems in the form of models and of predicting their possible properties. In particular, the construction of pilot plants or prototypes for designing complex technical / physical systems usually requires a considerable expenditure in terms of time and material. Hence, a logical approach is the initial application or development of models in the form of mathematical equations which describe the physical laws that govern the systems concerned. These models then constitute the basis for more specific designing of pilot plants or prototypes and for more efficient planning of experimental testing programs. Moreover, the control of complex systems can often be significantly improved with the application of models as a supplementary measure, for instance. Hence, the introduction of methods and processes for modelling and simulation into all fields of specialisation during recent years is not surprising: from the natural and engineering sciences, through medicine and environmental research, all the way to the economic and social sciences.

CUTEC has reacted to this development with the establishment of the Modelling and Simulation Department toward the end of 2003. At present, the department comprises four scientific employees, three student assistants, as well as six students.

Test stand: Detector for mine clearing

To date, the department has been financed with its own acquired third-party funds; as a consequence, the field of activity at the Department of Modelling and Simulation is highly diversified: Thus, R&D projects on a wide variety of questions are executed by specialists in many different fields. In particular, a geologist and a computer scientist are at work on the development of new technology for clearing of mines, together with students assigned to the task, a computer scientist is working together with students on the development of a predictive controller – an interdisciplinary project with the Department of Thermal Processes – and an engineer as well as students are busy with modelling of solar distillation plants. Other major R&D fields include autonomous robots controlled by neural networks, optimising of gypsum production processes, and support systems for protection against disasters. In the coming years, a special challenge to the department will be designing the interface between computer science, on the one hand, and the engineering sciences at CUTEC, on the other hand, in such a way that research and development projects can be executed faster and more efficiently by interdisciplinary cooperation. (re/he)

BMBF-Initiative "Networks for Renewable Energy Research"

Successful completion of the project; continuation of the activities planned

Conventional energy sources are currently being re-evaluated from the economic and environmental-political standpoints. On the one hand, an increasing worldwide demand for energy has been predicted; on the other hand, fossil fuel reserves are limited. At the same time, soil contamination at former industrial sites and other harmful effects on soil are almost ubiquitous in Europe. In view of the progressing scarcity of conventional energy sources and of soil as a natural resource, appropriate remedial measures must therefore be implemented in a sustainable and environmentally compatible manner.

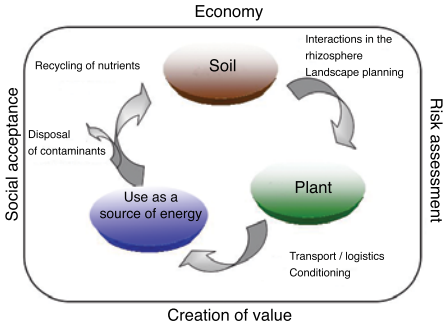
On behalf of BMBF*, some forty engaged parties from politics, economy, society, and science have now dedicated their efforts to this task: Within the scope of the international excellence network, "Network for Energy from Phytoremediation", testing has been in progress since 2003 for determining the suitability of plants for use as sources of energy. The plants under investigation have been selected on the basis of their specific properties for improving the quality of soils. For the first time, this methodical approach has been critically discussed on an interdisciplinary basis within the network from technical, socioecological, and economic standpoints. For this purpose, the fundamental idea of the network partners can be summarised in a simple way:

Biomass + harmful effect on soil – renewable energy + soil improvement

In the course of a public concluding symposium, which took place on 28th and 29th September 2005, the aforementioned approach was explained to the participants; the process chain from the soil, through the plant, all the way to utilisation of the biomass as a source of energy was described, and the results achieved in the network were presented.

The exchange of experience with reliable structures hitherto conducted within the network should be continued. Possibilities of funding further activities are currently being sought; this search includes the establishment and expansion of joint research on the main topic in two parts – obtaining energy and conserving the soil as a natural resource.

The documentation on the "state of the art", prepared by the network, with descriptions of case studies for the defined research requirement, will be published soon. (kra)



Methodical approach to the network topics (diagrammatic representation), as given by D. Perbandt, 2005

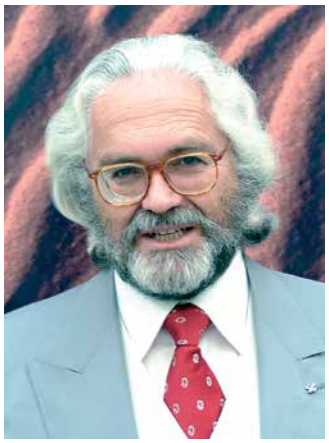
*BMBF: Bundesministerium für Bildung und Forschung

CUTEC represented at Agritechnica and at the conference, neugierig.05

For agricultural specialists from all over the world, Hannover was the focus of attention during the week from 6th to 12th November 2005: Agritechnica – the world's largest industrial fair for agricultural technology – was held on the fairgrounds of Lower Saxony's capital city.
During the spring of the past year, CUTEC was already present at "Energy" and LIGNA, at Lower Saxony's stand shared by several companies, and – upon invitation by the Chamber of Agriculture – was then present at Agritechnica with an exhibit on the topic of "Biomass to Liquid". With the ArtFuel exhibit, a scale model of our pilot plant for the production of synthetic fuels from renewable raw materials was presented to the visitors. In an expert and charming manner, the CUTEC team accompanied the interested audience in their quest for knowledge on location, "From Biomass to Fuel".
The enthusiastic response from specialists among the visiting public, which was particularly evident from numerous discussions and many enquiries at a high level of specialisation, contributed to the complete success of the exhibit at the fair.
On 26th August, CUTEC took part in the conference series, "Innovation Lower Saxony: neugierig.05" in Hannover, which was attended by a total of four Lower Saxon research institutions external to universities. The conference was held on the premises of the LZH – Laser Zentrum Hannover e. V. – and of the IPH – Institut für integrierte Produktion Hannover gGmbH – and was devoted to the topic of "Mobility –Discover Innovations in Lower Saxony". During the event, the highly diversified fields of work at the four research institutes, which cooperate very closely with industry, as well as a few of their current projects, were described. In the afternoon, Minister of the Economy Hirche presented a speech at the conference and announced the winners of the competition, "GründeN 04", a search for last year's most successful company establishments at university locations.
The fourth participant, DIK – Deutsches Institut für Kautschuktechnologie e.V., – and CUTEC were present with their own stands in the IPH entrance hall. One of the highlights at the CUTEC stand was a live discussion with ArtFuel plant personnel at the Institute in Clausthal. Two scientific employees were on duty to answer questions from participants in Hannover on the topic of synthetic fuels from renewable raw materials. This feature was supplemented by an oral presentation on the topic of innovative fuels for mobility in the future, which was held by CUTEC in the afternoon. (he/wes)

Enthusiastic visitors at Agritechnica inquire about the ArtFuel project

We extend our congratulations to …


Picture: Sympatec

Dr.-Ing. E.h. Stephan Röthele

... Dr.-Ing. E.h. Stephan Röthele, member of our Scientific Advisory Board, upon receiving his honorary doctor's degree. On 30th September, an honorary doctorate was conferred to this creative scientist and successful businessman in an official ceremony with some 300 guests from the Technical University of Clausthal. This great distinction, which is very rarely awarded by the University, was conferred to him in recognition and appreciation of his accomplishments as Diplom-Ingenieur in the field of particle sizing technology. He is Managing Director and major shareholder at Sympatec, which was established in 1984. This company is a world leader in the field of particle sizing technology for analysing the properties of ultrafine particles and is one of the most successful company establishments which have originated from the Technical University of Clausthal. A staff of about 100 persons is employed at the company headquarters, where administration and production were united under one roof in an impressive new building in Clausthal a year ago.


Kay-Morten Schenk

... our employee in the electrical workshop for many years, Kay-Morten Schenk, on his appointment as data protection representative at CUTEC in February. In this capacity, he is responsible for ensuring that the data protection requirements at our company are satisfied in compliance with the German Federal Law Relating to the Protection of Data. (he)

Report from the Workers' Council

Prof. Carlowitz has committed himself to the objectives of further developing the organisation of CUTEC and of guiding our company toward excellence and thus toward the future in a pole position.
This process is moderated by the designated management consultant, Dr. Martin Müller-Wolf / SMO Network AG. The first step was the distribution of questionnaires for completion by the scientific personnel. For accompanying and supporting this process of development, a steering team external to the hierarchy has been appointed. Many thanks to Prof. Carlowitz! (Nearly) all levels and departments are now represented in the steering team. All members of the team, especially the leaders, Mr Wessels and Dr. Zeller as Chairman of the Workers' Council, are prepared for offering suggestions and making proposals for corresponding improvements.
Resolutions have already been passed on ten concrete actions which are intended to help in guiding our company on the way to excellence. (ze)

Potato starch for dewatering of harbour silt

With a well-known approach and new flocculation technology: Tests on silt from Hamburg Harbour

For clearing the channel and basin in Hamburg Harbour, some 8 100 000 m^3 of sediment is dredged annually. After classification of the dredged material, about 1 100 000 m^3/a of contaminated silt is dewatered in the so-called METHA III plant (mechanical separation of harbour sediment). This dewatering plant, with a throughput rate of 200 t/h for solids, is the world's largest facility of this type. Commercial polymers on a crude-oil basis are currently employed for dewatering.

For examining the possibility of using modified potato starch instead of these polymers, the Agency for Renewable Resources (Fachagentur für Nachwachsende Rohstoffe, FNR), Gülzow, has recently approved a two-year project. The project is being executed at the Department of Physical and Biological Processes in cooperation with the working group of Prof. Kulicke, Institute of Technical and Macromolecular Chemistry, University of Hamburg, the company Emslandstärke GmbH, Emlichheim, and the Hamburg Port Authority with METHA III. The objective is to optimise the flocculation process for minimising the consumption of starch.

A highly promising approach is to combine the "dual flocculation" process developed by Prof. Kulicke's working group with the CUTEC developments "floc sensor" and "flocculation reactor", as well as the new starch products from Emslandstärke. In the dual flocculation process, oppositely charged polymers, that is, cationic and anionic polymers, are added in succession. Especially the forces of attraction between the polymers are thus utilised for optimising the flocculation. The flocculation sensor and flocculation reactor are known from the field of sludge dewatering (as reported in a previous issue) and are described on our website (www.cutec.de).

Site for the application of optimised technology: Hamburg Harbour

The recent approval is a continuation of the success achieved during the first year. During this initial phase, it has been shown that the results of the dewatering process can be predicted by on-line analysis of the flocculated silt. Predictability of this kind allows the implementation of new control and optimising strategy at the METHA III plant. As a surprising additional development, it has recently been demonstrated that renewable raw materials can be economically substituted for a portion of the conventional polymers. Thus, the FNR objective of promoting the increased availability of renewable raw materials on the market can also be achieved by funding of research.

During the coming two years, tests will be prepared and conducted at the METHA III plant, especially on a pilot scale. In the course of these tests, optimising of the control strategy and improved adaptation of starch products will also be investigated, among other questions. (siev)

First European RENEW Summer School

The first European Summer School, which was held within the scope of the RENEW program on the topic of renewable motor fuels on the Environmental Campus in Birkenfeld from 29th to 31st August, proved to be a complete success. The event was coordinated and organised by B.A.U.M. Consult GmbH and took place under the leadership of Dr. Michael Stöhr on location. A total of 111 persons from 16 countries attended the lecture series: students, company representatives, and political decision makers. The highly diversified mixture, which comprised a total of 25 lectures on engineering and general-survey topics, not only provided an excellent overview of the subject, but also imparted detailed knowledge to the audience. For CUTEC, Dipl.-Ing. Schindler spoke on "CFBR – the CUTEC concept of biomass gasification"; Dipl.-Ing. Keich, together with two assistants, attended to the organisation. Mr Knochen was responsible for the communications and video technology, as well as for video recording of the oral presentations. Thus, the lectures will remain available for a web-based lecture course which can later be offered to interested specialists among the public. (ke/he)

Audience at the lectures in Birkenfeld

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Edithor: Dr. T. Heere
Authors:
Prof. Dr.-Ing. O. Carlowitz (ca)
Dipl.-Ing. H.-J. Gehrmann (ge)
Dr. T. Heere (he)
Prof. Dr.-Ing. M. Beckmann (bm), Universität Weimar
Dipl.-Ing. O. Keich (ke)
Dr.-Ing. B. Kragert (kra)
Dr.-Ing. T. Onyeche (on)
PD Dr.-Ing. M. Reuter (re)
K.-M. Schenk (sk)
Dipl.-Ing. W. Siemers (si)
Dr.-Ing. M. Sievers (siev)
Dr. T. Zeller (ze)
Layout and setting: G. Wessels (wes)
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Tel. +49 5323 933-0 · Fax +49 5323 933-100
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International know-how transfer: visiting scientists at CUTEC

Based on its close cooperation with the Technical University of Clausthal, and of course its own in-house Department of Environmental Technologies, CUTEC has established something of a tradition in welcoming practical trainees, students and scientists from abroad for varying periods of time to work on project-specific research in one of the departments, often linked to a personal goal of obtaining a doctorate at the local university. Their key point of contact and source of support at CUTEC during their stay in Clausthal is the International Operations Manager Dr. Onyeche, who also meets the group of visiting scientists on a regular basis to exchange ideas and to make sure they are comfortable at CUTEC and are being integrated into the departmental teams. Indeed, it was he who first initiated the visiting scientist programme back in the year 2000, with a view to promoting environmental awareness in the home countries and providing the visiting scientists

Dr. Onyeche (centre) and "his" visiting scientists

themselves with intensive practical environmental training based on the state-of-the-art laboratories and techniques employed at CUTEC. Thanks to his international contacts and close relationships with government ministries and foundations, by which the visiting scientists are provided with financial assistance either directly in their home country or in Germany, scientists from many different countries have found their way to Clausthal over the years. What they all have in common is an interest in innovative environmental technologies and the underlying processes. On returning to their home countries, their role as "CUTEC ambassadors" has generated a large number of new contacts, some of which have resulted in local project partnerships. The experience gathered by CUTEC with the visiting scientists has proved thoroughly positive, and each and every one of them has brought new ideas into the organisation. The fact that the ladies sometimes even outnumber the gentlemen among the scientific community is clearly demonstrated by this photo, taken in front of the CUTEC building complex. (he/

Practical trainee from France in the Energy Park

Prof. Carlowitz extends to Mr Girard (l.) his best wishes for the future

On the basis of the contacts established with the Region of Normandy in France in 2004, a practical trainee from France was welcomed at CUTEC in the summer of 2005. Nicolas Girard from INSA Rouen (comparable to a German university of applied sciences) was employed in the Energiepark Clausthal project. During the period from 6th June to 16th September, he first started the operation of the solar collector plant and the heat pump; this was followed by technical adaptations. He subsequently performed and evaluated a series of measurements. The results, including an economic appraisal, have been compiled in a final report. CUTEC has experienced Mr Girard as a highly engaged and competent young scientist. (si)

Training at CUTEC

Today: Mr Dreilich in the electrical workshop

As already reported in the previous issue of CUTEC-News, CUTEC decided to support the Harz Mountain Region as a training company in 2004.

In the summer of 2004, training of an electronics technician for plant technology began in the electrical workshop. After a written and practical selection procedure as well as a personal interview, the choice was made in favour of Michael Dreilich from St. Andreasberg, who is now being trained as an electronics technician by Mr Schenk.

Regardless of whether power systems engineering or communications technology is involved, a multitude of electronic devices is present everywhere nowadays. In industry, smooth trouble-free interplay between mechanical and electronic components is a prerequisite for the automation of machines and plants. Electronics technicians for plant technology are responsible for ensuring that the electronic systems function properly. They assemble and install components for electric power supply, measuring, open- and closed-loop control systems, communications equipment, power-train technology as well as lighting facilities. They put these systems into operation and ensure that they remain in good condition. A further task is the actual operation of the facilities. Knowledge of modern open- and closed-loop control technology is a necessity, not only in plant operations, but also in dealing with factory equipment, power distribution systems, building facilities, and production plants, as well as processing plants.

A prerequisite is the successful completion of the tenth school year, either at the Hauptschule or at the Realschule (secondary technical school). Mathematical ability, technical comprehension, and skill in working with one's hands are especially important qualifications. Anyone who wishes to earn further qualifications can go on to become a technician, master electrician, or master electronics technician. Engineering studies at a university of applied sciences are also possible after successful completion of one's training.

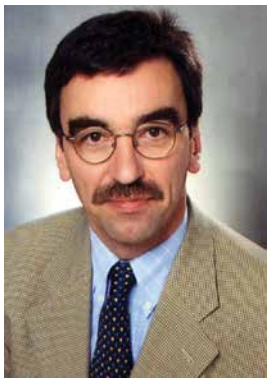
Mr Dreilich is currently learning in the electrical workshop, the mechanical workshop, and at the trade school in Osterode.

The duration of the training program is of 3.5 years. During the first quarter of 2006, Mr Dreilich will be admitted to the intermediate examination. (sk)

Trainee Dreilich (l.) with his instructor Mr Schenk in front of a logo (SPS)

Scientific Advisory Board at CUTEC:

Prof. Dr.-Ing. Peter Cornel, a personal profile



Prof. Dr.-Ing. Peter Cornel

Prof. Cornel has served as professor at the Technical University of Darmstadt since 1999. In this capacity, he teaches and performs research in the Department of Civil Engineering and Geodetic Surveying and heads the Division of Waste-Water Engineering at Institut WAR (Institute for Water Supply and Ground Water Conservation, Waste-Water Engineering, Waste Engineering, Industrial Material Circulation, Environmental and Town Planning). His special fields of research include industrial waste-water treatment, membrane technology, and sludge disintegration, and he has published numerous articles on these topics during recent years. In his fields of specialisation, Prof. Cornel is currently active in more than a dozen committees and is a member of numerous institutions. Furthermore, he has served as Dean of the Department of Civil Engineering and Geodetic Surveying as of the past year and was appointed as honorary professor at Quingdao University of Technology in China last summer. His professional career began with a course of study in chemical engineering at the Technical University in Karlsruhe, during which he earned his Diplom in 1978. He then completed his doctoral program with the degree of Dr.-Ing. in Karlsruhe under Prof. Sontheimer, professor of water chemistry at the Engler-Bunte Institute in 1983, where he served as scientific employee during the period from 1978 to 1983. After his return from a postdoctorate at the Department of Civil Engineering at Stanford University in the United States, Prof. Cornel assumed leading functions at several industrial companies in the fields of process engineering, water and waste-water treatment until his appointment as professor. In parallel, he also served as sole managing director of the Laboratorium für Adsorptionstechnik GmbH from 1992 to 1998. Prof. Cornel was appointed to the Scientific Advisory Board at CUTEC upon recommendation by Dr. Sievers, Head of the Department of Physical and Biological Processes at CUTEC. They became acquainted with one another at seminars, conferences, as well as membership in committees, such as the GVC-DECHEMA specialised committee, "Production-Integrated Water/Waste-Water Technology". Prof. Cornel intends to support CUTEC in the field of water and waste-water engineering by consistently promoting the company's orientation toward the re-use of water in industrial as well as municipal water-resource policy in the future. As he puts it, "A change in paradigm must be introduced and promoted. Used water is not merely 'liquid waste' earmarked for disposal. Waste water is a raw material which can be converted to a useful product, 'industrial water', by adequate treatment, that is, treatment which corresponds to the intended use". In his opinion, considerable effort will still be necessary for convincing people, in order to achieve this objective. Within CUTEC, he intends to accomplish this by means of appropriate suggestions and discussions during the meetings of the Advisory Board. Beyond CUTEC, specialists must be convinced of the advisability of a sustainable water-resources management policy based on recycling. Among other benefits, this can certainly help in achieving favourable expert response to the research proposals submitted by CUTEC in this field. (he)

DATES:

- 4th International Conference "Oxidation Technologies for Water and Wastewater Treatment" from 15th to 17th May 2006 in Goslar
  Further information and registration forms are available at: www.cutec.de/aop4
- CUTEC Presentation at ACHEMA 2006 in Frankfurt from 17th to 19th May 2006 Hall 1.2, Stand A6

New and familiar faces in the CUTEC team

Support for the operative departments

Support for the Modelling and Simulation Department and training in the Management Department From left: Dipl.-Geol. Berta Rosendo Vales, Britta Kahla, and Stefanie Auberg

Berta Rosendo Vales completed her studies in geology at the University of Zaragoza, Spain, during which she also spent two years at the Technical University of Clausthal as an Erasmus student. Since 1st August 2005, she has been employed at the Department of Modelling and Simulation. Within the scope of the project, "Humanitarian Mine Clearance", she has been investigating the effect of various soil and environmental parameters on the signal quality of metal detectors.

Dipl.-Chem. Markus Maly, Dipl.-Ing. Olaf Neese, and Dipl.-Ing. Sebastian Rubin are by no means unknown at CUTEC. For several years, they have been performing valuable services at the Institute of Environmental Sciences at the Technical University of Clausthal. In July and October 2005, they transferred to CUTEC. In the future, they will support the Departments of Chemical (Mr Maly and Mr Rubin) and Thermal Processes (Mr Neese) with their excellent research work.

For Britta Kahla, Stefanie Auberg, and Till Bauerochs, it was the first venture into professional life in the Commercial and Accounting Department at CUTEC on 1st August 2005. Mrs Kahla has begun her training as an accountant and is thus the second trainee in this field. Mrs Auberg and Mr Bauerochs are completing a one-year vocational training course – within the scope of a continuing education program at the vocational school for business – in order to qualify for a university of applied sciences (he/wes)